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THE MEDICAL HISTORY OF ISHI

BY

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INTRODUCTION

Often the incidental records of human life are the most interesting and illuminating. The factors of health, hereditary predispositions, and psychic reactions are of greater directing influence in the affairs of men and the making of historic events than is ordinarily understood.

It is not without anthropological value that the following brief notes are recorded concerning the personal idiosyncrasies, physical attributes, somatic disorders, and pathologic findings of Ishi, the last Yahi Indian.

At the time of the capture of our informant, he was undoubtedly in a state of starvation. He was extremely emaciated and weak (plate 38). As has been described by Waterman,[1] this capture took place at Oroville, August, 1911.

[1] Univ. Calif. Publ. Am. Arch. Ethn., XIII, no. 2, p. 64, 1918.

The photograph taken at that time shows how great the privations must have been to produce such a state of physical attenuation.[2] Ishi himself later made the statement that he was not sick but had no food. White men had taken his bow and arrows; game was scarce, and he had no means of procuring it. He had strayed from his usual trail, between Deer creek and Mount Lassen. The railroad on one side and a large river on the other kept him from making his way to the refuge of the hills. His fear of trains and automobiles seems to have been considerable in those days.

Upon being captured, Ishi, according to his own account, was handcuffed, confronted by guns and pistols, and intimidated to such an extent that he vomited with fear. He was taken to the county jail where he was held several days before he was rescued by Waterman and transferred to the University of California. During this time, he said he touched no food and drank almost no water, so great was his dread of the white man. His treatment in jail seems actually to have been kindly enough, and he certainly aroused much more curiosity than brutality; but he was undoubtedly badly frightened.

He was taken to the University of California Museum of Anthropology in San Francisco. Here he was made to understand the friendly feeling of the white man, and he began to comprehend the scheme of civilization to which he had hitherto been a stranger. He was given food and clothing, and was taught the many inhibitive lessons of modern life.

SICKNESS OF NOVEMBER, 1911

On November 22, 1911, less than three months after his arrival, he was taken sick with a cold, or a respiratory infection, and was entered as a patient in the University Hospital. The record of this illness is as follows:

CLINICAL RECORD FROM THE FILES OF THE UNIVERSITY OF CALIFORNIA HOSPITAL, SAN FRANCISCO

Nov. 22, 1911. Blood Examination.—Hemoglobin, 96%. Red corpuscles, 4,516,000. White cells, 18,000. Polynuclears, 85%. Large Mononuclears, 11%. Small Mononuclears, 4%. Eosinophiles, negative. Blood Cultures, negative. Blood smears, negative for plasmodia malaria.

Nov. 23, 1911. Tuberculin Reaction.—Calmette, negative; von Pirquet, negative; Moro, negative.

[2] *Ibid.*, plate 1.

Urinalysis.—Yellow, clear. Specific gravity, 1022. Reaction, acid. Sugar, 5%. Albumen, negative. No pus. No diazo reaction.

Nov. 25, 1911. Sputum Examination.—Small amount, thin and watery; sputum streaked with bright red blood. No acid, fast bacilli, few gram positive diplococci.

Stool Examination.—Liquid—brown—no occult blood; no parasites, eggs, or pus.

Blood Pressure.—125 mm. mercury.

Dec. 26, 1911.—Photograph taken of feet. Ishi has had temperature only once since he came in, and then only for a few hours.

Jan. 24, 1912.—Since then he has had only moist râles. Considerable thin frothy sputum—never hemorrhagic.

Feb. 2, 1912.—He is discharged to-day with his cough cleared up though he has some expectoration. *Diagnosis:* Broncho-pneumonia.

Dr. Markel,
Dr. I. W. Baldwin,
Internes.

During this illness the temperature chart shows that for the first week Ishi's fever ranged between 38° and 40° C. His pulse ranged between 60 and 105, his respiration between 18 and 35. It will be observed that his reactions to tubereulin at this time were negative. But the record at this early date indicates how susceptible he was to respiratory infections.

SICKNESS OF SEPTEMBER, 1912

On September 15, 1912, he was again entered as a patient in the University Hospital, this time with a diagnosis of abdominal pains of unknown origin. His history in brief is taken from the records.

Sept. 15, 1912. Ishi entered the University Hospital the second time. The associate curator, Mr. Gifford, says that Ishi has a bad cold and has not appeared to be at all well for three days. He refused to get up this morning. When questioned he complained of pain and tenderness in the left para-umbilical region. No satisfactory record of the condition of his bowels or of his appetite was obtained. He vomited a little clear fluid immediately after coming to the ward.

The examination is as follows:

Eyes.—Pupils regular and equal; react to light and accommodation.

Nose.—Discharging mucus.

Mouth.—The tongue clear.

Breath.—Not foul.

Tonsils.—Atrophic.

Heart.—Negative.

Lungs.—Both sides of chest move synchronously and equally. No demonstrable dullness. He complains of cramp-like pains in the left para-umbilical region; tenderness on deep palpation over area indicated on chart. [Chart omitted.]

Abdomen.—No distention. Rigidity, a little more on the right side than on the left. Doughy mass felt in region of ascending colon; some tenderness and stiffness on palpation over this area; seems to feel more comfortable with knees drawn up.

Knee Jerks.—Positive and sluggish.

Blood Examination.—Red corpuscles, 4,800,000. Whites, 10,000. Polynuclears, 76%. Large mononuclears, 4%. Small mononuclears, 20%. Eosinophiles, negative.

Urinalysis.—Pale yellow, clear. Specific gravity, 1015. Acid reaction. Sugar, negative. Albumen, negative. No casts. No red cells. A few round epithelial cells.

Temperature.—Normal.

Pulse.—Between 50 and 60.

Respiration.—Between 15 and 24.

Discharged September 18, 1912. *Diagnosis:* abdominal pains of unknown origin. Condition improved. *Treatment:* Calomel and Magnesium sulphate.

Ishi's recovery from this attack was apparently complete, and he gradually resumed his work as assistant janitor in the Museum.

CHARACTERISTICS OF ISHI

About this time I became an instructor in surgery in the University Medical School, and thus came in contact with the Indian.

From the first weeks of our intimacy a strong friendship grew up between us, and I was from that time on his physician, his confidant, and his companion in archery. He often asked if I were not part Indian, which, although it is not a fact, I naively admitted I was.

The Museum is near the Hospital, and since Ishi had been made a more or less privileged character in the hospital wards, he often came into the surgical department. Here he quietly helped the nurses clean instruments, or amused the internes and nurses by singing his Indian songs, or carried on primitive conversation by means of a very complex mixture of gesture, Yana dialect, and the few scraps of English he had acquired in his contact with us.

His affability and pleasant disposition made him a universal favorite. He visited the sick in the wards with a gentle and sympathetic look which spoke more clearly than words. He came to the women's wards quite regularly, and with his hands folded before him, he would go from bed to bed like a visiting physician, looking at each patient with quiet concern or with a fleeting smile that was very kindly received and understood.

ISHI'S MEDICAL BELIEFS

Women.—Ishi had many of our own obsolete superstitions regarding women. One criticism he made of the white man's civilization was the unbridled liberty we give menstruating women. The "Sako mahale," as he designated them, were a cause of much ill luck and sickness. They should be in seclusion during this period. In fact, he often commented on the number of sick men that came to the hospital. I asked him what he thought made so many men sick. He said it was "Sako mahale, too much wowi (houses), too much automobile," and last but most important of all, the "Coyote doctor," or evil spirit.

Dogs.—Playing with dogs, and letting them lick one's hand, Ishi said was very bad. He assured me that to let babies play with dogs this way led to paralysis. It is interesting to note that Dr. R. H. Gibson of Fort Gibson, Alaska, has reported the coincidence of poliomyelitis among the Tanana Indians and the occurrence of distempers in dogs.[3]

Rattlesnakes.—Ishi's treatment for rattlesnake bite was to bind a toad or frog on the affected area. This is interesting in the light of the experiments of Madame Phisalix of the Pasteur Institute, who demonstrated the antidotal properties of salamandrin, an extract obtained from salamander skin, and the natural immunity that the salamander has to viper venom. Macht and Able have obtained a similar powerful alkaloid from the toad *Bufo nigra*, called bufogin, which has some of the properties of strychnin and adrenalin. It has been used as an arrow poison by South American aborigines. Experiments which I conducted with salamandrin as an antidote to crotalin, show that it has a pronounced protective and curative value in the immunization of guinea pigs and in their cure after being bitten by the rattlesnake. It is, however, too dangerous and potent a poison itself to be of any practical value.

When out camping we killed and cooked a rattlesnake or "kemna." Ishi refused not only to taste it, but also to eat from the dishes in which it had been cooked. We ate it, and found that it tasted like rabbit or fish. Ishi expected us to die. That we did not do so he could only explain on the grounds that I was a medicine man and used magic protection.

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[3] Journal American Medical Association, Feb. 28, 1914.

Moon.—Ishi held the superstition common among uneducated Caucasians, that it is unwholesome to sleep with the moon shining on one's face, so he covered his head completely under his blankets when sleeping in the open.

Hygiene.—Ishi had wholesome notions of hygiene. When out hunting he has several times stopped me from drinking water from a stream which he thought had been contaminated by dwelling houses above.

His residence in the Museum caused many misgivings in his mind. The presence of all the bones of the dead, their belongings, and the mummies were ever a source of anxiety to him. He locked his bedroom door at night to keep out spirits. When we stored our camping provender temporarily in the Museum bone room, Ishi was not only disgusted by genuinely alarmed. It was only after the reassurance that the "bunch a mi si tee" could not enter through the tin of the cans that he was relieved.

Surgery.—On some of his visits to the University Hospital, Ishi gazed through the glass-panelled door of the operating room and watched the less grewsome scenes therein, wondering no doubt what was the meaning of this work. At times, when it seemed proper, I took him into the operating room and placed him in the visitors' stand where he could watch the entire procedure of a surgical operation. He was an attentive spectator, and his questions afterward, though few and imperfectly understood, showed that he marveled most at the anaesthetic and that he debated the advisability of such surgical work.

Once he saw me remove a diseased kidney. He viewed the sleeping man with deep wonder. He seemed interested at the methods we employed to prevent hemorrhage. For days afterwards he asked me if the patient still lived, and seemed incredulous when I said he did. When he saw an operation for the removal of tonsils he asked me why it was done. I told him of the pain and soreness which was indicative of disease, and necessitated the operation. He conveyed to me the information that among his people tonsilitis was cured by rubbing honey on the neck, and blowing ashes down the throat through a hollow stick or quill; no operations were necessary.

The only surgical operation with which he seemed familiar was scarification. This was accomplished by means of small flakes of obsidian and had as its purpose the strengthening of the arms and legs of men about to go out on a hunt.

Herbs.—His own knowledge of the use of medicinal herbs was considerable, as we learned later when he went back to Deer Creek canyon with us on a three weeks' camping trip. Here he designated scores of plants that were of technical, economic, or medicinal value. But he put very little faith in these things. The use of herbs and drugs seems to have been the province of old women in the tribe.

There was a hole in the septum of his nose which he had probably used as a receptacle for a small piece of wood, as well as for holding ornaments. When he had a cold he placed in this spot a twig of baywood or juniper, and indicated to me that this was medicine. It served very much with him as menthol inhalers do with us. Its influence was largely psychic but agreeable.

Magic.—The real medicine was magic. The mysteries of the k'uwi, or medicine man, were of much greater value than mere dosing. Their favorite charms seem to have been either the blowing of smoke and ashes in certain directions to wield a protective or curative influence, or the passing of coals of fire through themselves or their patients by means of sleight of hand. They also sucked out small bits of obsidian or cactus thorns from their clients, averring that these were the etiologic factors of sickness.

The principal cause of pain, according to Ishi, was the entrance of these spines, thorns, bee stings, or, as he called them, "pins," into the human frame. The medicine man sucked them out, or plucked them while they were floating in the air in the vicinity of the sick man. They were then deposited in a small container, usually made of the dried trachea of a bird, or of a large artery. The ends of this tube were sealed with pitch or some form of a stopper and the whole thing taken possession of by the doctor, thus keeping the "materia morbosa" where it could do no further harm.

The fact that I was able to do sleight of hand: vanish coins, change eggs into paper, swallow impossible objects at will, and perform similar parlor magic, convinced Ishi that I was a real doctor, much more than any medication or surgery at my command. He came, nevertheless, to our clinic whenever he had a headache, or a bruised member, or lumbago, and accepted our services with due faith. His first attack of this latter complaint is recorded as follows:

SICKNESS OF MAY, 1913

Clinical Record

May 21st, 1913.—Entered the hospital for the third time. Complaint, pain in the back.

Eyes.—Examination shows pupils regular and reacting to light and accommodation. Eye muscles negative.

Ears, Nose.—Negative.

Skin.—Sclera. Mucous membrane, negative.

Throat.—Negative.

Tongue.—Slightly coated.

Teeth.—Poor. Gums, pyorrhea. Purpuric spots on gums. [Probably a mistake about pyorrhea.]

Thyroid Gland.—Negative.

Examination of Chest.—Negative.

Heart.—Apex not seen or felt. Dullness in the fifth space, 10 cm. from the middle line to the left. No dullness to right of sternal margin. Sounds regular, good quality, faint, no murmurs.

Pulse.— Radials equal, regular, good volume and tension.

Abdomen.—Rounded, symmetrical, tympanitic; thick, flabby wall; no tenderness. [He had become fat by this time.]

Liver.—Dullness at the sixth rib intercostal margin in the nipple line. Liver edge, spleen, kidneys not felt.

Back.—Apparently some rigidity of lumbar and also dorsal region, but impossible to make sure of any real signs. No great tenderness.

Blood Examination.—Negative.

Urinalysis.—Normal.

Temperature.—Normal.

Diagnosis.—Myalgia.

Treatment.—Acetyl-salicylic acid.

Discharged, May 23, 1913, cured.

ISHI'S PERSONAL HABITS

Sleep.—In 1915, after his first tubercular diagnosis, in order to keep him in the most favorable environment, Ishi was given a little canvas house on the hill back of the Museum. Here he slept and spent much of his time. He had to be taught to keep his windows open at night, and even this outdoor sleeping did not please him. He always preferred to sleep in his old room on the second floor of the Museum where it was warm and dry. His bed was a canvas cot and he slept between blankets in preference to sheets. He had several flannelette nightshirts but he preferred to sleep naked, taking off all his clothes in the dark after his roommate, Mr. Loud, an attaché of the Museum, had retired and extinguished the light.

Clothing.—In the daytime he most frequently wore a khaki shirt and trousers, cotton socks and army shoes. At first he was offered

moccasins, but he refused to wear them. He wanted to be like other people. Usually he wore a bright colored necktie and sometimes a hat, when he was going down town. In cold weather he wore woolen underwear, but he did not seem to need it. On rare occasions he put on an old raincoat in inclement weather. A few discarded woolen suits were given him, but cotton shirts and trousers were his choice. He used a pocket handkerchief in the most approved manner, and because of his frequent colds he needed it often.

Modesty.—Ishi, strange to say, was very modest. Although he went practically naked in the wilds, and, as described by Waterman, upon his first appearance in Deer creek canyon he was seen altogether nude, nevertheless, his first request after being captured was for a pair of overalls. He was quite careful to cover his genitalia when changing clothes, assumed protective attitudes, and when swimming in the mountain streams with us wore an improvised breech clout even though his white companions abandoned this last vestige of respectability.

Toilet.—When well he bathed nearly every day, and he always washed his hands before meals. He was very tidy and cleanly in all his personal habits. When camping, he was the only man in our outfit who got up regularly and bathed in the cold mountain stream every morning.

Ishi was an expert swimmer (plate 40). He used a side stroke and sometimes a modified breast stroke, but no overhand or fancy strokes; nor did he dive. He swam under water with great facility and for long distances. The rapids of Deer creek were rather full yet he swam them, and carried my young son hanging to his hair.

When he was sick he resented being bathed except when ordered by the nurse or doctor. Like many other primitive people, he considered bathing injurious in the presence of fever. He never attempted to take a sweat bath while in civilization, but often spoke of them. I never saw him brush his teeth, but he rubbed them with his finger, and they always seemed clean. He washed his mouth out with water after meals.

His beard was sparse but he plucked it systematically by catching individual hairs between the blade of a dull jacknife and his thumb. In his native state he used a sort of tweezers made of a split piece of wood. He did this work without the use of a mirror.

He combed and brushed his hair daily. He washed it frequently, drying it by filliping it and beating it with a small stick as it hung

in the sunlight. At first he had no dandruff, but after two or three years' contact with the whites he had some dry seborrhoea, and began to get a trifle gray at the temples. I offered him bay rum to use on his hair, but he never adopted this effete innovation. He said that he used grease on his scalp when in his native state; whereas bay leaves and bay nuts he said were heated and reduced to a semi-solid state, when they were rubbed on the body after the sweat bath. Here they acted as a soporific, or, as he said, like whiskey, and the person thus anointed fell into a sweet slumber. The same substance was rubbed on moccasins to make them waterproof.

On one occasion he contracted ring worm, probably from a wandering cat. He was given a sulphur salve for this, and after its cure he still used the ointment to soften his hands, very much as ladies use cold cream. He assured me that it was good. He was not susceptible to "poison oak" (*Rhus diversiloba*) nor to sunburn. His skin bleached out considerably while in San Francisco, and became darker when exposed to sunlight.

In his clothes box he kept several cakes of soap and seemed to have the same fondness for sweet-scented soap that Orientals manifest. Even talcum powder was there, which he called "lady powder." But I never saw him use either, and I rather suspect that the powder was a gift.

His personal belongings he kept in a most orderly manner, everything in his box being properly folded and arranged with care. Articles which he kept outside of this box he wrapped in newspaper and laid in systematic arrangement on shelves in his room.

In working on arrows or flaking obsidian, he was careful to place newspapers on the floor to catch his chips. In fact, neatness and order seemed to be part of his self-education.

In the preparation of food and the washing of dishes he was very orderly and clean. In fact in the latter vocation he was by far the best artisan in our camp.

Diet.—He was, at the time I first knew him, a man of medium stature, approximately 5 feet 6 inches tall, and weighing about 165 pounds. His weight varied greatly during his four years' stay with us. This was due to his changed methods of eating and exercise. At first he rather abandoned himself to the pleasures of an unlimited food supply. He fed at the nearby Hospital and had at least two full meals daily, besides a luncheon of his own preparation. This was greatly in excess of any dietary heretofore possible to him. In

consequence he increased in weight rapidly and became ungracefully fat. After a certain period of this luxury he discerned the folly of this course and began eating less, when his metabolism returned to a more normal balance. Part of this increase was due to the large quantities of water he drank. Being unaccustomed to salt, our seasoning was excessive and led to increased hydration of his bodily tissues. He had a great fondness for sweets: candy, jelly, cake, ice-cream, all were favorite articles of diet. He tried and liked nearly all kinds of foods, but seemed to have an aversion for custards, blanc manges, and similar slimy confections, nor could he be persuaded to drink milk. He contended that this was made for babies, while he said that butter ruined the singing voice. After some months of residence with us, he developed methods of preparing his own food in the basement of the Museum.

By this time he was given a small salary for his services as janitor. He purchased his articles of food at neighboring grocery stores, indicating his selection by pointing his finger at the desired object and saying, "How much money-tee?" He learned to use a small gas stove for cooking.

Matches he took up with evident delight; they were such a contrast to the laborious methods of the fire drill, or of nursing embers, which he employed in the wilds.

He bought bread, jelly, tea, coffee, sugar, canned salmon, meat, salt pork, sardines, cheese, potatoes, beans, rice, dried and fresh fruit, syrup, honey, and canned milk. This latter he took with his coffee until he discovered that it was milk, when he stopped using it.

His frugality became a little too pronounced occasionally, and it was necessary to remonstrate with him on the matter. Usually he ate three meals a day: a very early breakfast, and two other meals at the usual hours. He was influenced probably by the work and meal hours of his companions. He cooked his potatoes by boiling them with the skins on and eating them dry. His meat he boiled only about ten minutes, eating it practically without seasoning.

His own food in the wilds seems to have been fish, game, acorn meal, berries, and many roots. Prominent among these latter was the bulb of the brodiaea. The Indian could go out on an apparently barren hillside and with a sharp stick dig up enough brodiaea bulbs in an hour to furnish food for a good meal. These roots are globular in shape, with the appearance of an onion, ranging in size from a cherry to a very small potato. The flavor when raw is like that of a potato, and when cooked like a roasted chestnut.

Alcohol.—The use of alcohol soon became known to Ishi, and early in his stay with us several immature persons tried to make him intoxicated, but a stop was very promptly called in this direction and the error of their ways pointed out. Ishi himself had no liking for strong drink, although at one time he purchased a few bottles of beer and drank small quantities diluted with sugar and water. He called it medicine. His response to my query regarding whiskey was, "Whiskey-tee crazy-aunatee, die man." The sequence was strongly fixed in his mind. No temperance lectures were necessary, although several goodhearted members of the W.C.T.U. attempted to instruct his primeval mind in these matters. He had a fondness for ice-cream soda, which, with the moving pictures, constituted his entire accomplishments in debauchery.

Tobacco.—Occasionally Ishi smoked a cigarette, and he knew the use of tobacco, having had access to the native herb in the wilds. But he seldom smoked more than a few cigarettes a day, and frequently went weeks without any. He disapproved of young people smoking. He chewed tobacco at times, and spat copiously. Both of these indulgences, however, he resorted to only when invited by some congenial friend.

Etiquette.—Although uncultured, he very quickly learned the proper use of knife, fork, and spoon. His table manners were of the very best. He often ate at my home, where he was extremely diffident; watched what others did and then followed their example, using great delicacy of manner. His attitude toward my wife or any other woman member of the household was one of quiet disinterest. Apparently his sense of propriety prompted him to ignore her. If spoken to, he would reply with courtesy and brevity, but otherwise he appeared not to see her.

When he wanted to show his disapproval of anything very strongly, he went through the pantomime of vomiting. For instance, when he saw a callow youth with a mustache, for the first time, he expressed his disgust in an action which, interpreted, would correspond to our phrase "that makes me sick."

Thrift.—As janitor in the Museum, he was making a competent income, understood the value of money, was very thrifty and saving, and looked forward to the day when he could buy a horse and wagon. This seemed to be the acme of worldly possession to him. He was very happy and well contented, working a little, playing enough, and surrounded by friends.

ISHI'S DISPOSITION AND MENTALITY

Disposition.—In disposition the Yahi was always calm and amiable. Never have I seen him vehement or angry. Upon rare occasions he showed that he was displeased. If someone who he thought had no privilege touched his belongings, he remonstrated with some show of excitement. Although he had lived in part by stealing from the cabins of men who had usurped his country, he had the most exacting conscience concerning the ownership of property. He would never think of touching anything that belonged to another person, and even remonstrated with me if I picked up a pencil that belonged to one of the Museum force. He was too generous with his gifts of arms, arrow-heads, and similar objects of his handicraft.

His temperament was philosophical, analytical, reserved, and cheerful. He probably looked upon us as extremely smart. While we knew many things, we had no knowledge of nature, no reserve; we were all busy-bodies. We were, in fact, sophisticated children.

His conception of immortality was that of his tribe, but he seemed to grasp the Christian concept and asked me many questions concerning the hereafter. He rather doubted that the White God cared much about having Indians with Him, and he did not seem to feel that women were properly eligible to Heaven. He once saw a moving picture of the Passion Play. It affected him deeply. But he misconstrued the crucifixion and assumed that Christ was a "bad man."

Use of tools.—He was quite adept in the use of such simple tools as a knife, handsaw, file, and hatchet. He early discovered the advantages of a small bench vise, and it took the place of his big toe in holding objects thereafter. Larger bench tooks, such as the plane, the draw knife, the auger, the level, the square, and chisels, he rarely used. His measurements were made according to some dimension of his body, such as a palm's breadth, the length of his arm, etc. But he never counted paces or used any gauge for distances. Journeys were measured by days or sleeps.

He was extremely apt at contrivance with small objects, and his hut building, as demonstrated both in civilization and by his lodges in the wilds, showed ingenuity and skill. With larger building, however, he was not conversant. He marveled greatly whenever he saw carpenters construct a house, and was awe-struck when I took him to a sawmill where large cedar logs were brought in and rapidly sawed up into small bits to be used in making lead pencils. It would have

taken hours for him to fell even a small tree, and an interminable length of time to split it. But here was a miracle of work done in a few minutes. It impressed him greatly.

Use of English.—He loved to joke, and looked at the "funny pictures" in the papers, even laughing at some of the more obvious jokes. But he either could not or would not draw pictures himself.

With those whom he knew and liked he was remarkably talkative, rambling off into stories, descriptions, humorous episodes, and many unintelligible tales. When excited in his description his voice rose to a faint falsetto. He sweated with the ardor of his portraiture. He went through descriptive pantomime.

He labored with his simple tools of speech. Apparently he abbreviated his vocabulary to fit our comprehension; and I know that he sometimes changed his pronunciation to conform to our imperfect command of his dialect. If we could not get the refinements of his articulation, he often used the word as we did so that there would be no misunderstanding. In a way he spoke "broken Yahi" just as we speak "pigeon English" to foreigners.

He was a particular favorite with all small boys and from his many hours of conversation with them and with Museum visitors he learned much of his English. In consequence, his idioms had a flavor of slang, but were very expressive. When an elderly lady interested in his soul, asked him if he believed in God, he replied, "Sure, Mike!"

His English vocabularly by 1915 must have contained several hundred words and phrases. He knew the names of various peoples: English, Chinaman, Japanese, Wild Indian, Nigger, Irishman, Dutchman, policeman.

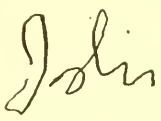
The following is an approximate of his vocabularly:

Hullo; nice day; too cole; too hot; too much water-tee; too much lazy-auna-tee; him lazy boy, smart boy; him crazy-auna-tee; hims good; hims no good; bad man; sleep; eat; work; sing; dance; I go; you go; you likey him?; lice (rice), pishy (fish); bean-us; honey; labit (rabbit); big one; little one; led (red); white; black; hat-na (hat); shoes; camisa (Spanish for shirt); mahale (mujer, Spanish for woman); lopa (rope); lopa pikta (rope picture or moving pictures); candy-tee; soda wata; whiskey-tee; smoke; doctor; big cheap (big chief); dog; kitty-tee; coyote; chicken-a-tee; egg; apple; owanga-tee; lemon; barnarna-tee; cracker; soap; powder; medicine; chair; sit down; talk; how much money-tee?; money; shoot; cut em; die man (death); sick man; ole man; lady; mama; papa; sister; papoose (baby); too much I smoke (fog); I all a time smoke; put em away; you go get em; what's a matter-tee?; you go pretty soon; long time; automobile; horse; telephone; fire; pistol (gun); pike (fight); evelybody happy; him cry; too much pina (pain); sheep-na; paka (vaca, cow); tea; koppy (coffee); milik (milk); nipe (knife); axa (axe); hatch (hatchet); papello (paper); light; all a same.

The Indian had no set phrase of greeting as we understand it. If we insisted upon it, he would say "Hullo," and as for a parting phrase, he never said more than "You go?" If one said "Good bye" to him, he remained silent. If he was forced to speak, and in later years he seemed to understand that some response was expected, he would say "Good boy," and undoubtedly meant it as a complimentary expression. It seemed to have no such meaning as it implied in our language "God be with you."

He never learned to say "Thank you." If he valued your service, he smiled. If your present pleased him he said, "Him's good!"

Knowledge of reading and figures.—He learned to sign his name on his cheques, and I have preserved one of his signatures. No attempt was made to teach him English or reading.



He could distinguish numbers to the extent that he could be trusted to ride alone on street cars bearing certain numerals, such as car No. 6 or car No. 17, both of which carried him from the ferry to his home. In a way he could tell the time by the clock. He knew midday, and any hour one pointed out to him, and he could be depended on to act on time. He carried a cheap watch some one had given him. It had a large chain and pendants attached. He wound it faithfully every day, but it was never set properly, and consequently was more of a comfort than a help. Nevertheless he was very proud of this possession.

An estimate of character.—I once took him to Buffalo Bill's Wild West Show. He always enjoyed the circus, horseback feats, clowns, and similar performances. While at the show we were watching some Plains Indians dress for their performance. A very dignified warrior, bedecked in all his paint and feathers, approached us. The two Indians looked at each other in absolute silence for several minutes. The Sioux then spoke in perfect English, saying: "What tribe of Indian is this?" I answered, "Yana, from Northern California." The Sioux then gently picked up a bit of Ishi's hair, rolled it between his fingers, looked critically into his face, and said, "He is a very high grade of Indian." As we left, I asked Ishi what he thought of the Sioux. Ishi said, "Him's big cheap (chief)." Apparently their estimates were equally complimentary.

CLINICAL HISTORY, MAY, 1914

At the height of Ishi's physical perfection I recorded the following:

We know nothing of the parentage of our subject. He was born probably about 1860 in northern California, consequently is approximately 54 years of age, but appears about 45. There is no record of childhood diseases.

He shows no signs of chickenpox or smallpox. No suppurating glands, boils, burns, or scars of any sort. His skin is light, reddish bronze, soft, sparsely endowed with hair.

The odor of his body is faintly musty, and suggests the smell of tanned deer hide. Bones small. Musculature is well developed, with an even distribution of subcutaneous fat. The hair of his head is black, straight, and of medium weight, slightly gray at the temples; in length it reaches his shoulders, having but recently been burnt off as a sign of mourning. He wears it over his ears, tied in a single brush down his back. The scalp shows some evidence of dry seborrhoea. His head is of the brachycephalic type. The measurements are as follows:

Length of head, 193 mm.
Breadth of head, 163 mm.
Cephalic index, 84.4 mm.
Length of face, 131 mm.
Breadth of face, 152 mm.
Length of nose, 54 mm.
Breadth of nose, 42 mm.
Nasal index, mesorhynian, 77.7 mm.

The skull is strongly made, with thick supraorbital ridges, mastoid processes, and external occipital protuberance. The jaws are strong and heavy. The teeth are all present, strong, colored slightly brown, no evidence of decay or pyorrhoea. The alignment of the lower incisors is not perfect. The molars are well worn but in good condition. Ears are well formed, of good size, and the lobes are pierced for rings. The eyebrows and lashes are of moderate length and thickness. The eyes are set straight, lids Caucasian in contour. The iris is dark brown; reactions to light and accommodation are normal. The nose is strong and wide, the septum pierced just above the cutaneous margin for the insertion of a small stick.

The tongue is clean and normal in color, no coating. The tonsils are slightly hypertrophied, showing signs of past inflammation. His breath is sweet and free from the fetor common to the average white man as noted by Powers.[4]

There are no enlarged glands in the neck, the thyroid is normal. No abnormal pulsations occur in the vessels. The neck is full and strong. There is a slight pad of fat over the seventh cervical vertebra. The chest is full, normal in shape, breasts a trifle large compared to Caucasian male standards, aerola not hairy, no axillary glands are palpable.

On percussion the lungs are normal; osculation is negative. The diaphragm moves equally on the two sides. The heart outline on percussion is normal, sounds normal. The pulse is 65; blood pressure 125 mm.; arteries are soft; pulse compressible, regular, good volume.

The abdomen is negative except for some tenderness in the right hypochondriac region. There is a slight surplus of fat. No disturbances of digestion, no flatus or constipation. Good appetite, regular habits. Abdominal reflexes normal.

The genital region is normal. No hernias nor enlarged glands exist. The genitalia are rather small but of normal character; pigmentation is accentuated in this region. He gives no history of venereal infections, but knows of their existence in a vague, general way. He seems to have had little actual experience in sex function; was never married, he says, because there were no marriageable women in his tribe. There are no urinary disturbances; no nocturia; apparently he is free from perversions.

The cremasteric reflex is normal. The thighs and legs are well formed. Knee jerks normal. The feet are broad and strong (plates 42 and 43). The toes are straight and unspoiled. The longitudinal and transverse arches are marvelously well preserved (plate 42, fig. 3). His abductor pollicis is very pronounced in its development. The foot is a beautiful example of what the human foot should be. His method of locomotion is that of rather short steps, each foot sliding along the ground as it touches. Neither the heel nor the ball of the foot seems to receive the jar of the step. The foot is placed in position cautiously, not slapped or jammed down. He progresses rather pigeon-toed, and approximates crossing the line of his progress each step. He springs from the great toe, which is wonderfully strong

[4] Stephen Powers, Tribes of California, Contributions to North American Ethnology, 1877, III, ch. 34, p. 403.

in its plantar flexion and abduction (plate 43, fig. 1). The plantar reflex is active. The skin of the sole is thick but not rough (plate 42, fig. 1). The toenails are round in outline, strong, and short.

He is not an agile runner nor does he have the spring and leg action of one who in his youth had been a sprinter. His stride is rather restricted and he lacks a vigorous thrust of the legs. The knees are not drawn up well in front. He has considerable endurance, and at walking he never seems to tire.

The spine is normal in contour, with a slight drooping of the head forward. The lumbar flexion is somewhat limited and he is subject to attacks of lumbago of mild degree. The pelvis is of generous proportions, strong. The sacro-iliac joint is firm, with no evidence of relaxation.

The hands are medium size, probably a number 8 glove. The fingers are gracefully tapered, pleasing in shape, with fingernails olivoid in outline, perfect in texture. The palms are soft and pliable. He is right handed. His grip at this time with the dynamometer registers as follows: Right hand 49 kilograms, left hand 45. These are maxima of many attempts.

He is a good informal wrestler, and scuffles with the men with evident delight. In the game in which two opponents clasp right hands, then attempt to upset the stand of the other, he is strong but awkward. He can box with the open hand in a deft though unskilled manner. He rather likes games of this sort, but no acrobatics appeal to him, nor does he ever attempt to exhibit his strength. He throws stones rather poorly, not with the strength and accuracy of one accustomed to games of ball (plate 39).

About this time Ishi was successfully vaccinated, and passed through the inoculation without trouble of any sort. In fact his health seemed improved after this procedure.

Ishi was vigorous, and a good worker when working with others, but indifferent to the beauty of labor as an abstract concept. He never fully exerted himself, but apparently had unlimited endurance. When fat he perspired freely. After a three weeks' trip in the mountains he was in the pink of condition and could journey all day without effort. He was at this time—May, 1914—undoubtedly in better health than at any time during his stay with us (plates 39, 40, and 41). He had had several respiratory infections, but up to this time he showed negative tuberculine reactions and there was no premonition of the illness which later caused his death.

Every effort was made to keep him in good health. He was encouraged to stay outdoors; he was kept away from infectious diseases. His diet was ample. He was given perfect freedom. When asked if he wanted to return to the wilds, he replied that he did not, because everybody was dead, only evil spirits inhabited the places of his former pursuits, and there was not enough food to eat there.

SICKNESS OF DECEMBER, 1914

In the winter of 1914, a change seemed to be taking place in our informant. He became listless, less inclined to bestir himself, complaining of various obscure infirmities. He seemed, to members of the Museum staff, to be growing darker in complexion. He had obviously lost weight, and coughed. In consequence of his unsatisfactory physical condition, he was entered for a fourth time in the University Hospital.

His clinical history is as follows:

Ishi.—Number 8371. December 10, 1914, to February 1, 1915.

Family History.—Unknown.

Past History.—Patient has been in U. C. Hospital, Medical Ward, on two previous occasions, Nov. 22, 1911; Sept., 1912.

Present Illness.—Complaint: pain in abdomen. Pain beneath sternum and in upper dorsal vertebra. For past month it has been noted by the Indian with whom Ishi is associated that his skin is becoming darker. He has complained occasionally of headache and pain in back of neck. He has been attending the Medical Out-Patient Clinic for past 3 weeks, since about Nov. 20, and during this time he has been constantly tender over the gall bladder area. Slight cough present for past two weeks since about Nov. 27, also marked constipation and anorexia.

Physical Examination.—Patient dark skinned Indian, lies comfortably in bed. Expression rather apathetic. He is well developed and well nourished. The muscles are slightly flabby. Skin very smooth. Neck is very short. Face broad with high malar prominences. Eyebrows thick, hair thick and long. Nose shows prominent alae nosae. Ears normal. Eyes: pupils round, react to light and accommodation. Mouth: large teeth in good condition. There are two small pigmented areas at the gum line of lower incisors. Tongue large, covered with grayish white material. Thyroid: lateral lobes just palpable. Right axillary and epitrochlear glands palpable, hard and shotty. Inguinal glands palpable. Carotids: left smaller than right.

Chest.—Symmetrical, slightly bowed, prominent 7th cervical and 1st dorsal vertebra with thick pad of fat covering. Expansion equal and fair. Supra clavicular fossae prominent.

Lungs.—Resonant throughout. Breath sounds rather faint over both lungs. On coughing and deep breathing there are a few moist crackles just below spine of scapula, right lung, and over base.

Heart.—Cardiac dullness extends from 3rd rib above to 9.5 cm. on the left at level of 5th rib and 2.5 to right of mid sternal line. The apical impulse not seen is felt as feeble localized impulse in 5th space inside nipple. Sounds are of faint quality best heard at pulmonic area.

Pulse.—Rate 76, equal, of fair volume, and low tension. Artery wall not sclerosed.

Abdomen.—Slightly prominent, symmetrical, moves freely with respiration. On palpation there is slight resistance in the epigastrium and there is a definitely

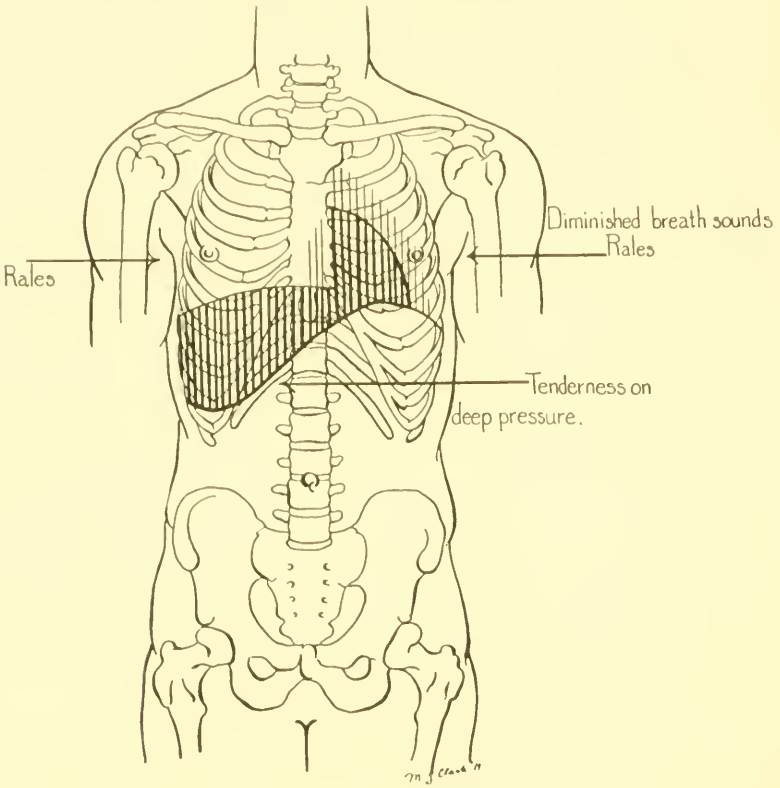


Fig. 1. Chart of Dec. 10, 1914

tender area on deep pressure just below the costal border right side, in mid clavicular line. One cannot feel a definite mass here but the edge of the liver is palpable just internal to this point. The lower half of the abdomen is soft. There is no dullness in the flanks.

Rectal Examination.—Prostate slightly enlarged, otherwise negative.

Back.—No dorsal tender points. No tender vertebra.

Extremities.—Normal.

Reflexes.—Normal.

Dec. 11.—Patient given 2 m. g. O. T. (Old Tuberculin).

Dec. 14.—During past 48 hours there has been a rise in temperature over two degrees with rise in pulse rate, a marked reaction, a marked increase in sputum

and in physical signs, e.g., moist crepitations on coughing, heard over right apex posteriorly and over right base.

Dec. 17.—Tuberculin (von Pirquet): positive in human and bovine after 48 hours. Lungs still show dullness at right apex and at right base with a few râles. Sputum is large in amount.

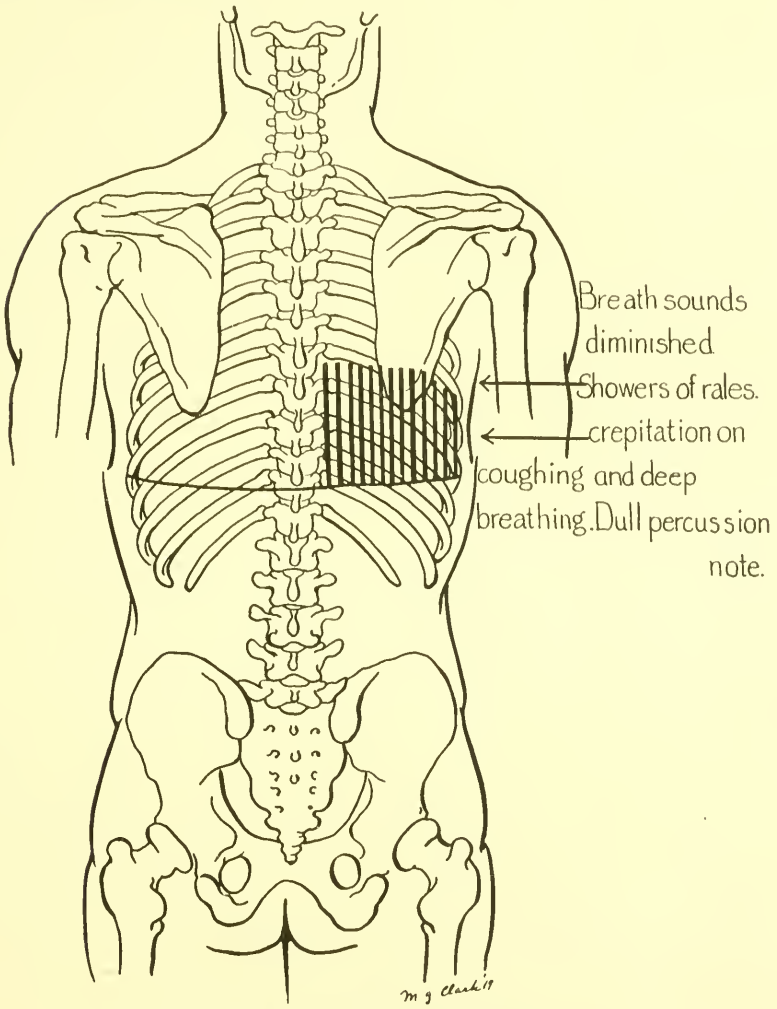


Fig. 2. Chart of Dec. 23, 1914

Dec. 19.—Examination of ears: negative. Examination of nose: turbinates enlarged and relaxed; slight amount of mucoid discharge on inf. turb. Examination of throat: tonsils relaxed with large dilated vessels. Wassermann on Serum, number 7521: negative.

Dec. 20.—Temperature has risen to-day and patient feels poorly. He was taken down to clinic yesterday for nose examination and possibly exertion was the cause of rise in temperature.

Dec. 23.—Breath sounds over entire right lung accompanied by showers of fine râles. Slight dullness at right base. No friction rub heard. (Dr. Allen.)

Dec. 28.—Although the temperature is now normal there still remains dullness at the right base and showers of fine râles over both bases.

Jan. 4, 1915.—Patient is feeling much better during last few days. Right base still shows some dullness and fewer râles are heard over right lung than before. The sputum raised is still large in amount.

Jan. 8.—Patient has been running slight temperature for past five days. Pulse slightly elevated. He complains of sharp stabbing pain over gall bladder region, especially on coughing. Copious sputum present, about 350 c.c. in 24 hours. There is no loss of weight.

Jan. 11.—Dr. Allen finds the same signs at right base as existing at last examination. The patient raises a large amount of thin greenish sputum.

Jan. 12.—The liver edge is palpable 3 finger breadths below costal border in mid-clavicular line. The notch is palpable and there is distinct tenderness over the gall bladder region. The gall bladder is not definitely palpable.

Jan. 19.—Sputum report: smears of sputum stained by acid fast method were negative. Treated with antiformin and after centrifuging, sediment was mixed with 5 c.c. of salt solution and injected intraperitoneally into a 320 gm. guinea pig—black and yellow angora. One month later: autopsy of guinea pig showed no tuberculosis. Diagnosis: negative for tuberculosis.

Jan. 21.—Liver has receded, edge just palpable beneath costal border. Tenderness over gall bladder area persists. Diminished breath sounds, dullness on percussion and many fine and medium moist crepitations on deep breathing still present at right base posterior below 8th rib. Sputum for past 24 hours, 350 c.c.

Jan. 25.—Dr. Moffitt finds dullness on percussion, diminished breathing, and fine crackles over right base. Also dull percussion note in right axilla as high as 4th rib. This dullness is not made out in the sitting posture. The liver feels somewhat nodular. The notch is felt.

Jan. 13.—X-ray of chest. Diagnosis: glands at right root and few small ones at left. (Dr. Ruggles.)

Feb. 1.—Patient discharged. Improved. To report back to hospital.

Diagnosis.—Respiratory infection of undetermined etiology. Positive tuberculin reaction.

This sickness marks an epoch in the life of Ishi. Retrospectively, it is very evident that his active tuberculosis starts from this date. Here for the first time we have accurate data indicative of the nature of his infection. His subcutaneous tuberculin reaction is strongly positive. His dermal reaction is confirmatory.

It is strange, however, that with all the subsequent findings no evidence of tubercle bacilli in his sputum could be demonstrated by microscopic search nor animal inoculations at this period.

The persistent pain below his right costal margin, so often referred to as a possible gall bladder lesion, from this time on becomes a constant feature of his symptoms, and is only explained by the final protocols.

Blood Examination

Dec. 10.—Ho. 85. *R. B. C.* 4,930,000 *W. B. C.* 7,800. Differential: neutrophiles 75. Lympthocytes 28. Large monos 6. Myelocytes 2. No parasites.

Urine Examination

Dec. 11.—Sp. gr. 1018. Acid reaction. No albumen. No sugar. No casts. Few uric acid crystals. Few *Ca* oxalate.

Sputum Examination

Date	*Character*	*Tubercle Bacilli*	*Other Organisms*	*Cells, Elastic Fibers Crystals*
Dec. 14.	Watery, with some purulent material in strings	Negative	Large non-acid fast bacilli predominated	Many pus cells
Dec. 15.		Negative after anti formin)		
Dec. 15.		Negative		
Jan. 8.	Watery muco-purulent	Negative	Many epithelial and pus cells	Very few organisms
Jan. 11.	Watery muco-purulent		No influenza seen	
Jan. 12.	Watery muco-purulent, greenish tinge, grayish sedimentation	Negative	Negative to influenza Great numbers of streptococci and diplococci. Gram.	Pus and epithelial cells No elastic fibers
Jan. 19.	Watery muco-purulent, greenish gray	Negative	Small amount of fungi	No elastic fibers

ISHI'S FINAL SICKNESS, 1915–1916

Ishi's last sickness, to all visible signs, started in the summer of 1915. He had been ailing all winter and showed an increased disinclination to shoot his bow or bestir himself.

In the summer vacation of this year Ishi was moved to Berkeley, where he was studied by Dr. E. Sapir, and very valuable data were obtained on the subject of his language and mythology. For three months he was in constant communication with Dr. Sapir, living at Professor T. T. Waterman's home under most hygienic conditions with plenty of outdoor recreation, sleeping, proper food, and diversion. Nevertheless, his health suddenly began to fail, and on August 22 he was returned to the University Hospital in San Francisco, where he remained for six weeks. The history of this period is as follows:

Ishi.—No. 9773. August 22, 1915.

Present Illness.—Since leaving the Hospital Jan. 29, 1915, patient has been sleeping in open air and general measures taken to overcome his tendency to respiratory trouble. During the past several months he has been in Berkeley where he was carefully looked after.

Several weeks ago he began to cough and complain of pain with breathing on left side of chest. He was examined by Dr. Pope about 10 days ago but nothing was found. Cough slight but constant.

Cough continued and, within the last week, he felt a sharp pain in left shoulder extending to left base in front with coughing on deep breathing.

The last few days the cough became so severe that he was sent to Hospital today. He has felt generally indisposed and has apparently lost some weight.

Physical Examination.—Medium sized, well built, dark skinned Indian, fairly well nourished, with long black hair in "pigtail" down back, prominent cheek bones, broad features, large, long nose. Patient lying in bed comfortable; not especially sick looking, coughing frequently very hard.

Ears and Nose.—Negative.

Eyes.—Sclera muddy. Pupils large, equal, circular, react to light and distance. Eye muscles negative.

Mouth.—Tongue moist, coated, large circumvallate papillae. Teeth not very good.

Tonsils.—Not remarkable.

Neck.—A large, soft lymph node on each side of neck front of sterno-mastoid just beneath angle of jaw. No epitrochlear glands palpable. Thyroid, negative. Carotids palpated, equal and synchronous. No remarkable neck pulsations.

Chest.—Well formed and developed. No pulsations. Thin body hair.

Lungs.—Dullness as shown in chart. Breathing harsh over right side; very diminished and absent at left base. At left base suggestion of bronchial quality to breath sounds with cough.

Heart.—Apex not seen nor felt. Dullness in 5th space 10 cms. to left of midline (1 cm. inside nipple line), above at 2nd space at right sternal border. Sounds regular, good quality, faint. No murmurs. Aortic and pulmonary sounds

are not accentuated. Radials, equal, regular, good volume, and tension. Artery walls soft. Rate 80 per minute.

Abdomen.—Soft, tympanitic; not tender.

Liver.—Edge felt 4 cm. below right costal margin in nipple line. Irregular mass or edge in mammary line.

Back.—Negative.

Extremities.—Negative.

Reflexes.—Triceps, biceps, radials, patellae equal and positive. Abdominal and cremaster lively. No Babinski.

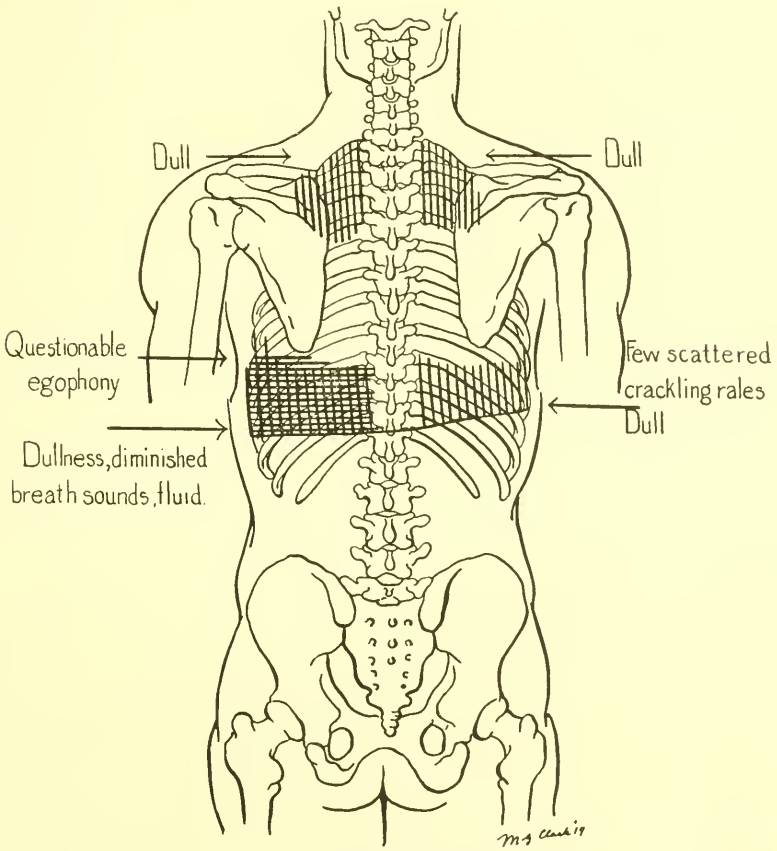


Fig. 3. Chart of Aug. 23, 1915

Blood Count.—Red cells, 6,000,000. White cells, 10,600. Differential leucocyte count: Neutrophiles, 75%. Eosinophiles, 2%. Basophiles, 0. Small lymphocites, 10%. Large lymphocytes and transitional, 12%. Myelocytes, 0. Parasites, none.

Urinalysis.—Specific gravity, 1010. Reaction, acid. No albumen, no sugar, no pus.

Sputum Examination.—Gray tenacious, great deal of thin mucus. No tubercle bacilli, streptococci, long mycelia-like threads, many epithelial cells, few pus corpuscles present.

Aug. 23.—Dr. Allen finds signs in lungs much as outlined above and thinks there is fluid at left base, with diffuse crackling râles at right base.

Aug. 24.—Tuberculin skin test: positive to human and bovine in 24 and 48 hours. Markedly positive: human 1.5 cm. × 1.5 cms. Bovine 1.3 × 1 cm. in diameter.

Aug. 25.—Ishi brings up quite a lot of gray tenacious sputa. He coughs less than before but still often during day and fairly hard, complains slightly of pain with cough. Not dyspnoic and apparently comfortable. No T. B. bacilli

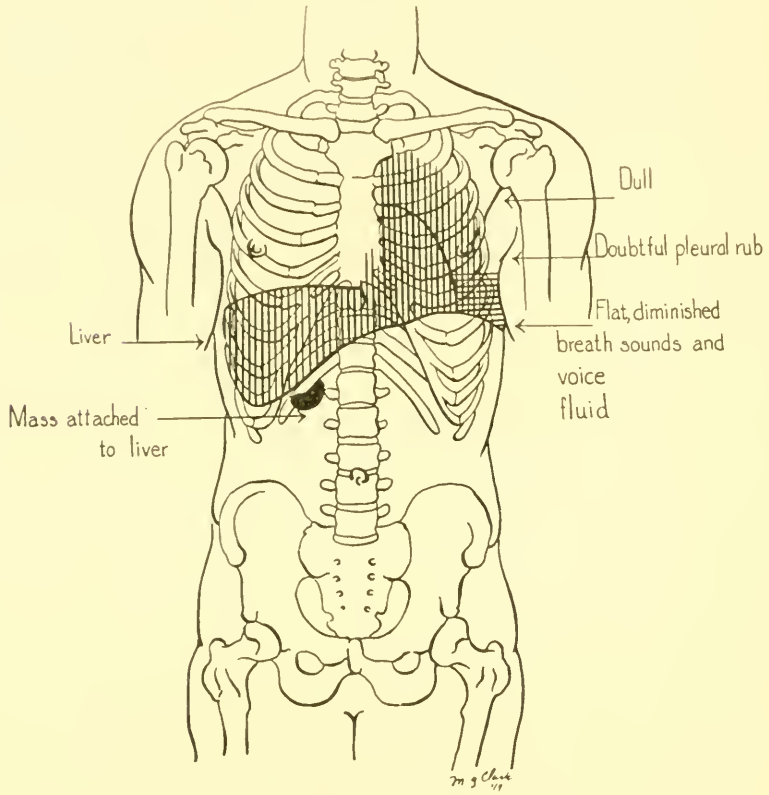


Fig. 4. Chart of Aug. 26, 1915

found in sputa, but a plentiful mixed flora of fusiform bacilli, spirochetes, cocci, and many large rods with mycelial morphology found.

What is probably a pleural-pericardial rub is heard over area of absolute cardiac dullness, synchronous with heart beat upon inspiration, disappearing with cessation of breathing. Dullness at left base and general signs here increased greatly.

Patient has had hiccoughs since 12 p.m. last night, but finally checked this P. M. with validol and sugar.

Aug. 26.—A marked change in lung signs in front has occurred since yesterday. The whole left chest in front is dull, except Traube's semilunar space, which is not obliterated. Heart not pushed to right.

Dr. Moffitt finds conditions as outlined on charts. Flatness and signs suggest fluid with a peculiar distribution. The fact that heart is not pushed to right would indicate old adhesions. No pleural pericardial rub heard today. Sudden onset of condition in upper left thorax might suggest a localized pneumo-thorax. Amphoric egophony made out with crepitations above the fluid.

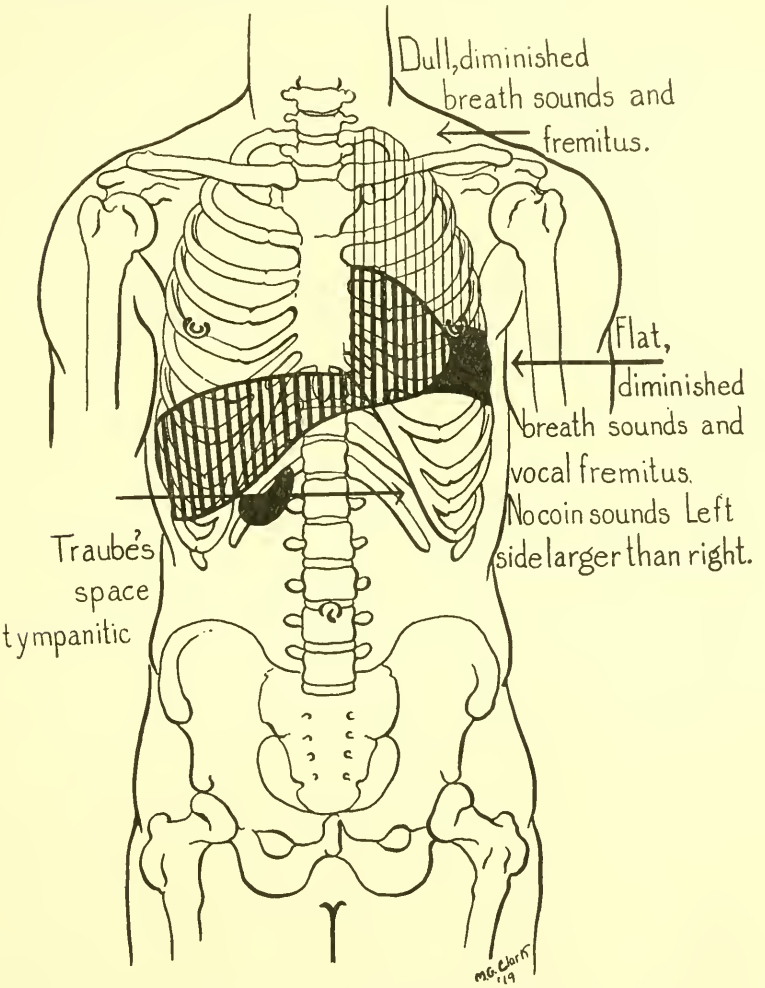


Fig. 5. Chart of Aug. 26, 1915

Dr. Allen finds very distant bronchial breathing, as if through fluid over lower left lung. Right side harsh breathing. Left top in front is dull, with character of high tympany.

Patient tapped this afternoon. Needle inserted in 6th space in midaxillary line. Fluid appeared immediately, 1600 c.c. of a clear straw-colored fluid withdrawn and as patient began to cough a little, needle withdrawn. Needle then inserted in 3rd space in midclavicular line (as dullness over left top still persisted) but no fluid found. Still fluid at base.

Chest fluid: 1600 c.c. clear, straw-colored (a little dark).

Revolta double positive; specific gravity 1026; coagulum quickly forms.

Albumen. Cell count: Lymphocytes 90.5%; polymorpho 7.6%; eosinophile 1.6%; endothelials 1.6%.

Hiccoughs continue. Only temporarily relieved by medication.

Aug. 27.—Left lung top below clavicle again dull this morning with a high tympanitic note. Some resonance still found in left axilla as after tapping, although less than right after tapping.

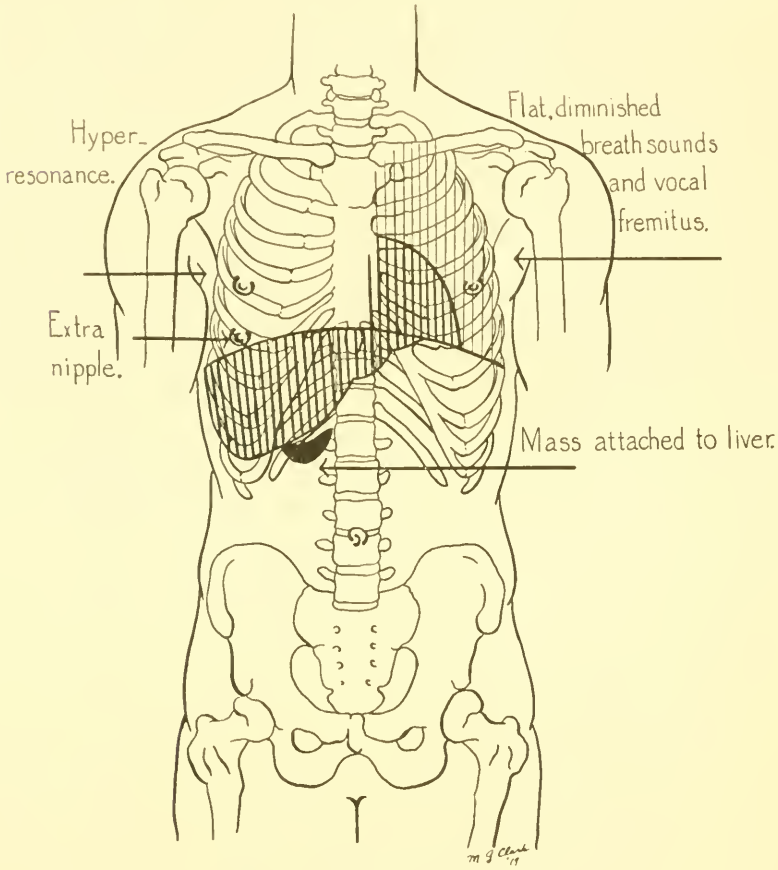


Fig. 6. Chart of Sept. 2, 1915

Percussion of back shows condition practically the same as shown on last chart. Hiccoughs have continued all through night and today, only temporarily relieved by any medication.

Sept. 2.—Hiccoughs have continued with intermissions. Stopped for a few hours by morphine. Fluid has apparently receded a little at the left base behind.

The tympanitic note over left upper chest still remains and has apparently become a little more marked. This area above cardiac dullness still remains very flat; but below in left axilla fair resonance is still found as after tapping, shading off into flatness at extreme base in axilla. Breath sounds heard but diminished. Traube's space clear, heart not displaced to right.

In the back, the flatness at left base is lower than before and the relative dullness above does not extend so high. Voice and breath sounds are still

diminished at left base but much louder than before. Many crepitant and crackling râles heard over whole area, especially at base. Here fluid has apparently receded.

Sept 4.—Physical signs about same. Hiccough only at short intervals. Cold in head and sore throat. Left tonsil red with a few white patches. Complains of headache.

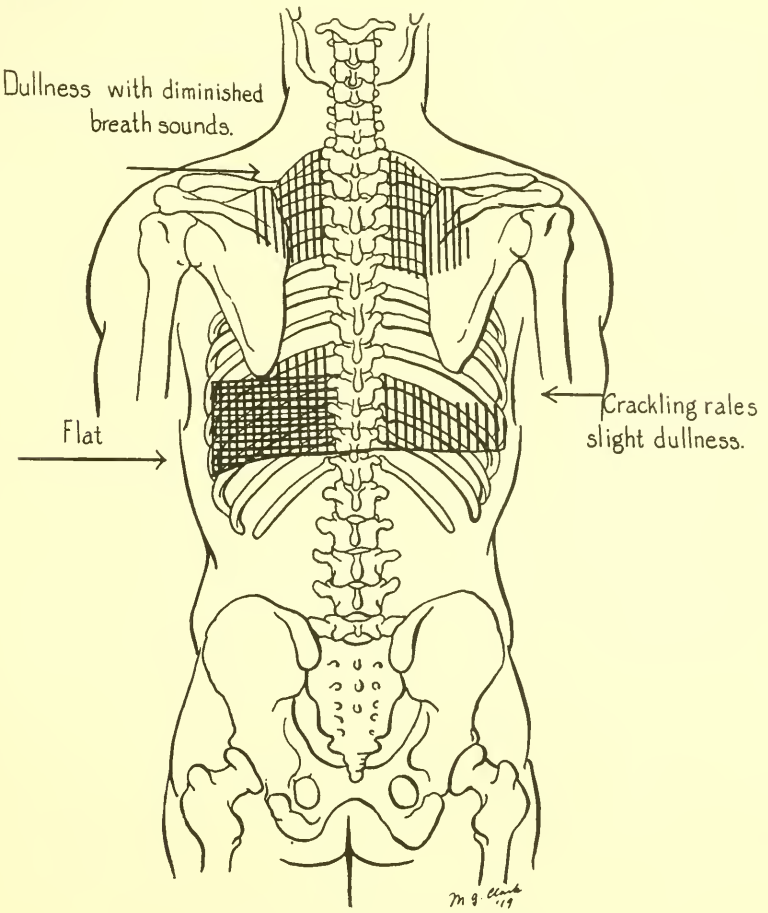


Fig. 7. Chart of Oct. 5, 1915

Sept. 7.—Exploratory thoracentesis with Luer syringe for withdrawing fluid and injecting subcutaneously. Needle inserted in 9th space in line with angle of left scapula, but no fluid found. Dullness still persisted up to 8th space, but not the absolute flatness encountered before. Breath sounds louder at left base with many diffuse râles at line of dullness and below, and faint bronchial breathing. Dullness at left top in front with less tympany. Left axilla fairly resonant.

Sept. 8.—Tympany gone from left lung. Fluid receding.

Sept. 16.—X-ray: increased density at left base, probably fluid.

Sept. 17.—Dr. Moffitt finds whole mediastinum shifted to left.

Condition apparently localized effusion at left top.

Very few signs in lung itself.

Sept. 29.—Patient still hiccoughs for short spells each day. Today hiccough has clonic character, occurring in groups of 3 and 4 together with a pause after each group, like a tic of the diaphragm. Left apex still dull with characteristics of walled off fluid. Heart apex impulse seen at nipple line.

Dr. Moffitt thinks the signs are very unusual for tuberculosis. There must have been shrinking with pulling of heart up and walling off of Traube's space. Evidently there is some encapsulated fluid at the left apex. Carotids are small and equal, evidently size of ordinary radials. Radials small. Femorals are large. Marked discrepancy between radials and femorals in size and pulsation on left. Radial systolic blood pressure equal 100; femorals systolic equals 132 kg.

Pigmentation of body seems generally deeper than formerly.

Electric reaction of phrenic: with stimulation of phrenics in neck, diaphragm responds to both galvanic and faradic currents, with a single contraction for each breaking or closing of current. The response is more easily elicited and seems stronger on right side than on the left.

Oct. 5.—Dr. Allen finds apex impulse very marked under the nipple but the nipple is in the 5th space. Heart seems to have been drawn up slightly.

Whole right side moves more than the left; hyper-resonance on the right. At left apex in front fair resonance just above and below clavicles but at level of 2nd space flatness begins and extends out to 5th space in axilla. Below this level there is tympany on the left. Respirations very faint over this flat area.

Over back, whole left lung is dull but no flatness except at extreme left base. Dullness increases toward base. Probably no fluid now at left base. Dullness with persistent crackles over right apex.

Gall bladder still palpated. Mass just below liver, attached to liver.

Oct. 6.—Discharged improved but still with definite signs of trouble in both lungs. Ishi is to be removed to a room in the Museum, where he can get more fresh air and sunshine with special arrangements for supplying him with food more suitable to his taste. After becoming stronger, he has been advised to return to the country and mountains and live more as he did formerly.

Diagnosis: pleurisy with effusion; chronic pulmonary infection of unknown nature. Probably tuberculosis of the lungs. Improved.

Chief of Medical Staff: H. C. Moffitt.
Assistants: W. H. Allen, E. S. Kilgore, J. L. Whitney.
Resident: E. H. Falconer.
Internes: F. H. Kruse, A. H. Maxwell.

Temperature during this time was of the tubercuious type with regular afternoon rise, and ranged between 37 and 38.6 C. His pulse ranged between 60 and 65 per minute; respiration between 16 and 25.

His medical treatment was directed most toward the relief of his distressing hiccough. He was given elixir terpene hydrate; validol; bismuth subnitrate; chloratone; chloral and bromides; morphine—all with little success.

An occasional laxative was ordered. His appetite was capricious. His weight fell from 65 kilograms to 60.

A note appended to the record is as follows:

Feb. 9, 1916.—Ishi has been in a room in the Museum since leaving hospital. He has continued to run a temperature of 101 to 103° F. in the afternoon rise; coughs a little and has been kept closely in bed, with liberal diet and hygienic

measures against tuberculosis. There are still indefinite signs of trouble at right apex with dullness up to 9th rib at left base, and the flat area over left front near top. Lung signs have not cleared much, if any.

At the expiration of his stay in the hospital, in October, Ishi was removed to temporary quarters arranged in the Museum, where he could have a large sunny room, well ventilated, and be attended by Mr. Warburton, an attaché of the Museum. It was planned that when he became a little stronger, he should be sent to the country, somewhere near his old haunts, and several possible places were considered. Tentative arrangements were made with responsible caretakers, but he never grew strong enough to travel.

During his months of sickness in the Museum, his clinical records were faithfully kept by Mr. Warburton, and Dr. Kruse and I were his constant medical attendants. In spite of careful nursing he failed to improve. No medical treatment being indicated, he was given practically none. His appetite became more capricious and fickle. Food distressed him, and he required anodynes at times to relieve his pain. His fever persisted in a tuberculous type and weakness became extreme. For hours he lay without moving, often gazing from his window and smiling with manifest delight at the antics of the iron workers clambering up the steel construction of the new University Hospital. He would say, "All a same monkey-tee."

Some days he summoned enough strength to make a few arrows, or to talk of his life in the wilds, or discuss hunting, bow making, Indian methods of hunting, folklore, and kindred subjects.

All this time he had a moderate cough; but repeated examination failed to show tubercle bacilli. His abdomen became more sensitive, and he developed signs of pyloric obstruction. After taking food he apparently experienced great pain. Even water caused him misery and I have seen him writhe in agony, with tears running down his cheeks, yet utter no sound of complaint. At this period, when he seemed to be failing so rapidly that the end must be near, I coaxed him to get out of bed and let me take his picture once more. He was always happy to be photographed, and accommodated me. It was only after the picture was developed that I recognized to what a pitiful condition he had been reduced. Had this been apparent before, I should not have asked this exertion of him.

This was his last picture, and compared with his varying poses, it records a tragic tale. We see him first as the gaunt, hunted wild man, his hair burnt short, his body lean and sinewy, but his legs strong

and capable of great endurance. He suggests the coyote in this character.

Later, civilization agrees with him, he loses his hunted look, rounds out his shrunken frame, and is happy in his new-found friends. Then comes a period of over-feeding, the luxury of food which he himself decides is not best for him.

In 1914 we see him at his best. On the trip to Tehama County he was undoubtedly in prime health. His stature is magnificent. Although he has lost the typical Indian litheness, there is grace and strength in every contour. For a year he was absolutely perfect. He worked, hunted, played, and enjoyed life.

Then a gradual change overcame him. His energy waned. He no longer was keen to shoot at targets with the bow. His skin became darker. He contracted another cold. He lost weight and wanted to rest most of the time. There were periods of slight improvement and we had hope that a return to his primitive mode of life might benefit him.

But as his malady increased, his cough became more distressing, fever consumed him, and eating became impossible. Our city water did not taste good to him, and he asked me to get him fresh spring water—"sweet water" he called it. We made a special effort to do this for him.

Although starving, racked with hiccough or coughing, and in more or less constant distress, he never complained. He never spoke of his suffering; never referred to death.

In March, 1916, when his weakness progressed to an extreme degree, we moved him back to the hospital where he could receive better nursing and alimentary feeding.

Shortly after re-entering the hospital he had a very large pulmonary hemorrhage. This was the first complication of this sort he experienced. I was called to his side. He was very weak and faint. With stoic calmness he looked at the quantities of blood that poured from his mouth and nose. I administered a large dose of morphia. He died soon after, at 12:20 P.M., March 25, 1916.

The clinical record of his last admission is as follows:

Ishi.—No. 11032. March 18, 1916. Well developed but extremely emaciated, dark skinned Indian lying in bed and hiccoughing frequently; vomiting and retching occasionally, evidently in great distress.

Facies shows broad prominently arched nose; high malar bones and sunken cheeks; orbital depressions deep, apparently from wasting.

Hair on scalp reaches to below shoulders, is thick, straight, and black with only a few gray hairs over the temples; eyebrows are dark and heavy; whiskers are thin and mostly gray; axillary and pubic hair normal; body hair scant.

Skin is in good condition and everywhere deeply pigmented (racial). Subcutaneous tissues greatly diminished.

Eyes.—Pupils equal, circular; react to light and distance. There is moderate arcus senilus. Sclerae are dirty white and vessels somewhat congested. Conjunctiva pale. Muscles negative. Fundi not examined.

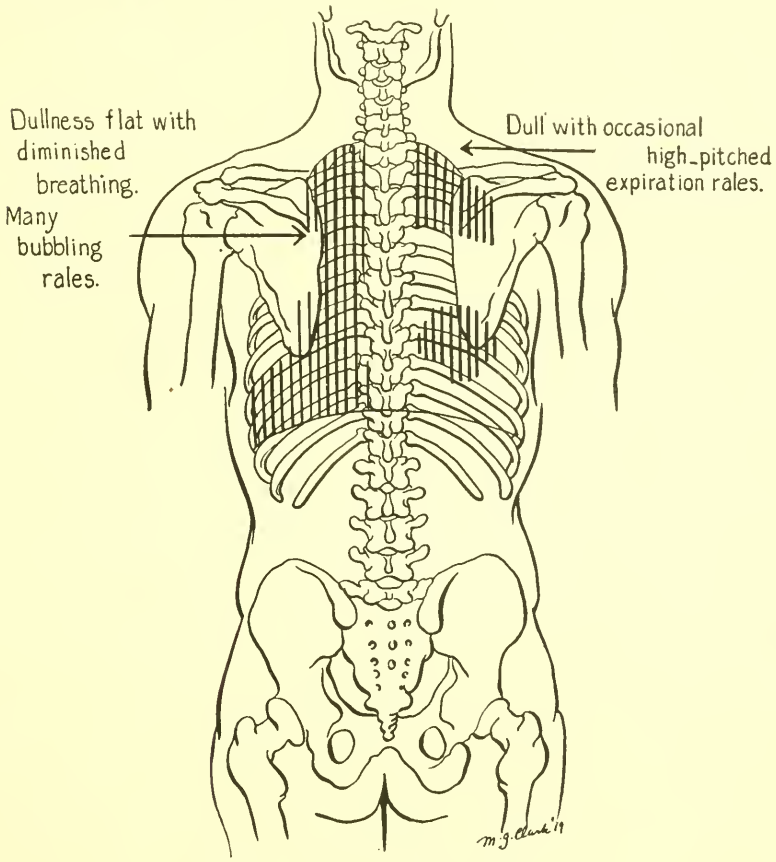


Fig. 8. Chart of Mar. 18, 1916

Nose.—Broad, high arched, with prominent alae nasae; mucous membrane pale; some discharge of thin mucous type.

Mouth.—Teeth are all present and slightly dirty but well preserved. Gums are dark and in very good condition. Tongue protrudes in midline, is clean; no tremor. Throat shows much saliva and debris from continual expectoration and vomiting. Tonsils negative.

Glands.—There is no marked superficial lymph adenopathy; epitrochlears or supra-clavicular not felt; thyroid negative.

Chest.—Emaciated with retracted supra and infra clavicular space; ribs, clavicles, and vertebrae easily seen and palpable; subcutaneous tissues and

muscles are greatly diminished; angles of scapulae stand out. Right chest moves slightly better than left.

Lungs.—As a whole, right chest shows better resonance than left, more râles and poorer quality of breathing on left, especially at left base below 10th dorsal vertebra. No Grocco sign can be made out.

Heart.—Apex impulse seen and felt in 5th space 10 cm. to left of midline (.5 cm. outside nipple line). Dullness from midline 11 cm. to left in 5th space; behind sternum to right. Sounds are rapid, of fair quality, with reduplication of the aortic and pulmonary sounds. No murmurs heard.

Pulse.—Radials are of poor volume, equal; walls are soft. Carotids, right larger than left. Dorsalis pedis palpable.

Abdomen is slightly scafoid and shows few spots of hyper-pigmentation. No visible peristalsis. Wall is rather tense, but no masses can be felt; liver is palpable 3 cm. below ribs and at right edge of rectus disappears beneath stiff muscle.

Spleen and kidneys not felt. No fluid.

Genitals.—Negative. Prostate negative. No abnormal masses felt.

Back.—Normal as far as can be ascertained. Thorough examination almost impossible [on account of weakness of patient].

Extremities.—Very greatly emaciated. Skin over feet is very dry.

Reflexes.—Patella and Achilles present and equal; Achilles very sluggish; no knee or ankle clonus; no Kernig or Oppenheim; plantar reflex normal. Abdominals and cremasterics present and normal. Wrist, biceps, triceps normal. Jaw jerk normal. No Chvostek or Trousseau signs.

Mar. 21, 1916.—Patient has coughed considerable and hiccough has been very annoying. He refuses all food and when coaxed to take small amount of nourishment, he vomits soon after. Attempt to pass stomach tube was unsuccessful. Tube appeared to meet with an obstruction about 2 inches above cardia. Patient was greatly irritated and attempt was not continued.

During this last week, the fever ranged between 37 C and 39.8 C. His pulse rate varied from 85 to 130 per minute, the respiration from 24 to 35. Other data are:

Blood Count.—Red cells, 4,950,000. White cells, 11,200. Hemoglobin, 75%. Differential count: Neutrophiles, 60%. Eosinophiles, 1%. Basophiles, 0. Small lymphocytes, 30%. Large lymphocytes, 9%.

Urinalysis.—Specific gravity, 1022. Reaction, acid. No albumen, no sugar. Bile pigment, acetone, and diacetic acid present. No pus. Few cylindroids present.

Treatment.—"Murphy drip" (salt solution per rectum), magnesium oxide, bismuth subnitrate, hot applications to the abdomen, morphine sulphate for pain.

Sputum Examination.—Watery, purulent clumps, streaked with blood. Bacillus tuberculosis in great number.

Irvin H. Betts, Interne.

Mar. 24, 1916.—Patient vomited about 400 cu. cm. of bloody material. Blood was frothy and partially dark and partially bright red in color. He has been receiving nourishment by Murphy drip (normal salt solution and 5% glucose, through colon tube.)

Mar. 25, 1916.—Again vomited about 250 cu. cm. bloody material. Given morphine sulphate gr. ½, hypodermically. At 12 noon he had a very severe

hemorrhage, blood gushing from nose and mouth. The patient died immediately. Discharged. Diagnosis, pulmonary tuberculosis. Condition, dead.

Discussion of case before autopsy.—Diagnosis: Advanced pulmonary tuberculosis, disseminated most at left apex. Hemoptysis. Fibrous tuberculous pleurisy, more at left base.

E. H. Falconer, Resident Physician.

POST MORTEM EXAMINATION

The autopsy was performed a few hours after the death of Ishi by Dr. J. V. Cooke. The report in full is as follows:

Post Mortem Record of the Pathological Laboratory of the University of California Hospital

Ishi. Hospital Number 11032. March 25, 1916.

The body is that of a considerably emaciated Indian 168 cm. in length. There is no rigor mortis. The body is still warm. The pupils are of moderate size and equal. No discharge from the ears. Slight bloody discharge from the nose and mouth. The thorax is large and emphysematous. The abdomen is of moderate size. The genitalia show some increase in brown pigmentation. Both testes are in the scrotum. The legs show a considerable emaciation and no evidence of edema.

Abdominal Cavity.—The fat in the anterior thoracic and abdominal walls shows a considerable atrophy and increase in yellowish pigment. The peritoneal surfaces are smooth and free from acute exudate. There are a few scattered nodules which vary in size from 1 to 8 mm. and which, on section, show gray somewhat translucent tissue and some of the large ones show central caseation. The mesenteric lymph nodes show a very considerable enlargement and a number of these nodules are found in the omentum and attached to the peritoneal surface of the mesentery. On the surface of the stomach and intestines there are found fair numbers of small similar nodules which are firm, gray, and many of them appear to be conglomerate masses. The lower portion of the right lobe of the liver shows a mass measuring $9 \times 5 \times 3$ cm. which lies in close contact and parallel to the lower border of the right lobe. This is semifluctuant and on section shows firm, fibrous encapsulation with some softened caseous material in the center. The surface of the liver shows a number of adhesions and there is a large nodule about 3 cm. in diameter, which, on section is caseous, attached to the anterior surface of the liver near the lesser curvature and also to the left lobe of the liver. The lower portion of the small intestine is adherent to the caecum and there are adhesions between the spleen and diaphragm. The pelvis shows a moderate amount of localized peritoneal foci similar to those in the remainder of the peritoneum. The appendix is 5 cm. in length and negative. The diaphragm reaches the fifth rib on either side.

Thorax.—On removing the sternum, the left lung is found firmly bound to the chest wall by old fibrous adhesions. The right lung is pale, voluminous anteriorly and shows some easily broken fibrous adhesions at the apex. The pericardium is smooth and the cavity contains about an ounce of clear yellowish fluid. The anterior mediastinal lymph nodes are enlarged and on section show some small areas of caseation with moderate hyperplasia.

Heart.—Weighs 210 grams and is noticeably small. The right auricle is small and the auricular appendage free from thrombi. The foramen ovale is closed. The tricuspid valve is negative. The right ventricle is of moderate size and the pulmonic valve and artery smooth. The mitral valve is thin and delicate. The chordae tendineae are not thickened. The aortic valves are negative. The arch of the aorta shows a few slight areas of yellowish thickening immediately above the valves and around the coronary arteries. For the most part, however, it is smooth and elastic. The coronary arteries are patulous and show a few small patches of sclerosis in their proximal portions. The myocardium is firm and shows a slight increase in brownish pigmentation.

Lungs.—The right lung weighs 770 grams. It is large, voluminous, and cushiony. It is crepitant and firm areas are felt throughout in the upper, middle, and lower lobes. The extreme apex shows a smooth, moderately contracted patch of pleural thickening measuring about 3 × 4 cm. Section through this area shows a cavity the size of a small walnut immediately beneath the pleura. This cavity contains blood clot and some fluid blood. On removing this the wall is seen to be somewhat irregular, gray, and covered with slight grayish exudate. Extending down into the pulmonic tissue from this point there is a firm consolidation into which the cavity is beginning to burrow. This cavity communicates with a moderate sized bronchus. A more anterior section shows numerous scattered, opaque yellowish gray foci 2 to 4 mm. in diameter lying in gray fibrous tissue. In places there are seen small cavities .5 to 1 cm. in diameter. This condition persists throughout the upper lobe.

The middle lobe shows numerous grayish small tubercles some of which are collected in firm masses about 1 cm. in diameter. The individual foci are gray and surrounded by a moderate amount of fibrous tissue. The lower lobe is riddled with foci of disseminated tuberculosis. The bronchi at the root contain blood clot which makes a cast of the larger bronchi. The pulmonic artery is negative. The bronchial lymph nodes are small and show a moderate amount of coal pigment. On section there are some grayish irregular foci of tuberculosis. The left lung is considerably smaller than the right and is very adherent to the chest wall. At the apex a portion of the lung had to be left attached to the parietal pleura. At the base and mesially the pleura showed a very marked fibrous thickening, being in places over 1 cm. in thickness. The pleura on section is grayish and caseous, although it is not softened, resembling the firm caseation sometimes seen in adrenal tuberculosis. The lung crepitates and is rather firm in the lower lobe. On section there are seen some disseminated tubercles throughout. The upper lobe anteriorly shows the most advanced process in the lung. Here are found several small cavities and one cavity about the size of a walnut which contains greenish yellow muco-purulent material. The bronchi at the root contain blood clots. The pulmonic artery is negative. The bronchial lymph nodes are considerably pigmented. On section they show gray tissue with small localized foci.

Spleen.—Weighs 140 grams and there are some fibrous adhesions over the capsule. The consistency is fairly firm. On section the pulp is reddish brown and smooth. The Malpighian bodies are distinct and do not appear numerous.

Liver.—Weighs 1240 grams. Over the surface, particularly over the right lobe, there are some tuberculous foci measuring 2 to 5 mm. in diameter and attached to the capsule. In the broad ligament there is a large focus, which, on section, contains yellowish gray caseous material. This area is 2 cm. in diameter. Numerous other areas are found in the region of the broad ligament but somewhat smaller than the one above mentioned.

Gall-bladder.—Is of moderate size and negative. The lymph nodes around the hilum of the liver are moderately enlarged and on section show grayish opaque foci. On section the liver tissue is quite pale brown and the lobules appear regular. Occasionally there is an opaque grayish focus about .5 to 1 cm. in diameter scattered through the hepatic substance.

Kidneys.—Are similar and together weigh 270 grams. The capsule strips easily and leaves a surface on which the fetal lobulations are still distinct. The cortex is quite opaque gray and the markings are regular. The Malpighian bodies are seen as minute red points. The pyramids, pelvis, and ureter are negative.

Adrenals.—The right adrenal is almost completely transformed into grayish, firm, caseous muscle. Only a small portion near the upper lobe shows the structure of the adrenal gland. The left adrenal shows near its middle portion a focus of tuberculosis about 1 cm. in diameter, but most of the gland remains and shows milky medulla and a moderate amount of lipoids in the cortex.

Urinary bladder.—Shows a pale mucosa and is negative.

Prostate gland.—Is not enlarged and on section is negative.

Alimentary canal.—The stomach is of moderate size and contains a considerable amount of clotted blood—altogether a pint. There is no obstruction to the outflow of the stomach. The duodenum contains a moderate amount of bile-stained fluid.

Pancreas.—Is soft and glandular on section. There is no gross evidence of increase in interstitial tissue.

Intestines.—The small intestine shows typical tuberculous ulcers which are more marked in the lower ileum. These are quite irregular and show excavated edges. These ulcers are found in the upper jejunum. The first one seen is about 50 cm. below the duodenum, is irregular in outline and measures about 2×3 cm. in size. The edges are raised and more or less irregular. The peritoneal surface at this point is riddled with small foci of tuberculosis which extend girdle-wise around the gut. Two or more ulcers are found one foot lower in the intestine, and as one passes down into the lower portion of the jejunum and into the ileum these ulcerations become slightly more numerous although it is unusual to find more than an average of one every foot.

In the lower portion of the ileum there are found in the Peyer's patches 5 or 6 small areas of ulceration about 3 cm. in diameter with thick grayish raised edges in which can be seen minute tubercles. Between these patches can be seen some small tubercles which have not yet broken down. In the lower ileum the mucosa shows a very marked irregular ulceration. There is a patch about 4 cm. in length which shows practically no normal mucosa but large serpiginous ulceration. Here the wall is very much thickened and the lymph nodes immediately beneath the intestines are large, matted together, and caseous. They measure from 1 to 3 cm. in diameter. The large intestine is free from ulceration. The process apparently stops abruptly at the ileocaecal valve.

The peritoneal surface of the intestines, particularly the small intestine, shows a considerable number of single and conglomerate tubercles around the foci of ulceration in the mucosa. There are, however, other foci of tuberculosis which are composed of small nodules varying from .3 to 2 cm. in diameter which are attached to the serosa by a thin layer of fibrous tissue and which are definitely pedunculated. These masses attached to the peritoneum are a rather marked feature of the peritoneal tuberculosis.

Mesenteric lymph nodes.—Are all considerably enlarged, some of them reaching 2 to 3 cm. in size. On section they show irregular grayish areas of caseation between which there is a translucent grayish tissue.

Aorta. from arch to bifurcation, is quite elastic and is of moderate size. There are some patches of subintimal fatty degeneration but apparently no evidence of arterial degenerative changes.

Brain.—Weighs 1300 grams. It is removed and shows no gross abnormalities with the exception of some increase in fat beneath the pia. The skull is small and rather thick.

Microscopic Examination

Heart.—The muscle fibers are small. There is no increase in fibrous interstitial tissue.

Lung.—One section shows numerous scattered small areas of tuberculosis, some of which are single and others conglomerate. These are central areas of caseation surrounded by giant cells, epithelioid cells, and lymphoid cells. Around some of these areas there is an exudate in the alveoli composed of leucocytes, lymphoid cells, and fibrin. In some places this exudate is caseous. Another section shows a large patch of caseous pulmonary exudate in which the walls of the alveoli are also involved in the necrosis. Around this area there is desquamative pneumonia and scattered tubercles. Another section shows a similar picture to the one described.

Mediastinal lymph nodes.—There is a moderate pigmentation by carbon and numerous scattered epithelioid tubercles, some of which show a central caseation. Giant cells are found in fair numbers.

Spleen.—The Malpighian bodies are small. Many portions of the pulp show a considerable amount of brownish pigmentation. This pigment is present in large phagocytic cells. Several small caseous tubercles are found which are atypical. The pulp is not congested.

Liver.—There are scattered small tubercles throughout the liver parenchyma, and moderate fatty change at the periphery of the lobules. Section shows one rather large area of caseation surrounded by epithelioid and lymphoid cells.

Kidney.—The convoluted tubules are irregular, swollen, and granular. No areas of tuberculosis are found and the interstitial tissue is not increased in amount.

Adrenals.—One section shows normal appearing adrenal gland except for a rather large caseous tubercle in the surrounding connective tissue. Another section shows almost complete displacement of the glandular tissue by necrosis. This area of necrosis is surrounded by epithelioid, lymphoid, and giant cells together with some fibrous tissue.

Intestine.—Section of one of the ulcers in the ileum shows a typical tuberculous process. The submucosa is infiltrated with large caseous tubercles and the mucosa has disappeared at one point leaving a ragged ulcer. There are many tubercles beneath the serosa and a diffuse infiltration with epithelioid and lymphoid cells.

Pancreas.—The acini and Islands of Langerhans are negative. There is no increase in interstitial tissue and no tubercles are found.

Scalp.—Appears normal.

Microscopic Diagnosis.—Miliary tubercles in lungs, spleen, and kidneys. Ulcerative tuberculous enteritis. Tuberculous peritonitis. Tuberculous bronchopneumonia and gelatinous pneumonia. Tuberculosis of adrenals. Parenchymatous degeneration of liver and kidneys.

Dr. Jean V. Cooke.

CONCLUSION

It is my opinion, and also that of Dr. Karl F. Meyer, Professor of Bacteriology in the University of California, with whom I have discussed the matter, that Ishi derived his infection through the intestinal route, and that he had the bovine type of tuberculosis. His was the genuine "pearl sickness," and he had relatively no acquired or hereditary immunity. Consequently his disease was rapidly fatal.

His body was carried to the undertakers, where is was embalmed. No funeral services were held. Professor T. T. Waterman, Mr. E. W. Gifford, Mr. A. Warburton, Mr. L. L. Loud, of the Museum of Anthropology, and I visited the parlor, and reverently placed in his coffin his bow, a quiver full of arrows, ten pieces of dentalia or Indian money, some dried venison, some acorn meal, his fire sticks, and a small quantity of tobacco. We then accompanied the body to Laurel Hill cemetery near San Francisco, where it was cremated. The ashes were placed in a small Indian pottery jar on the outside of which is inscribed: "Ishi, the last Yahi Indian, died March 25, 1916."

ISHI ON HIS DISCOVERY IN 1911.

ISHI IN MAY, 1914

ISHI SWIMMING IN DEER CREEK

Fig. 1

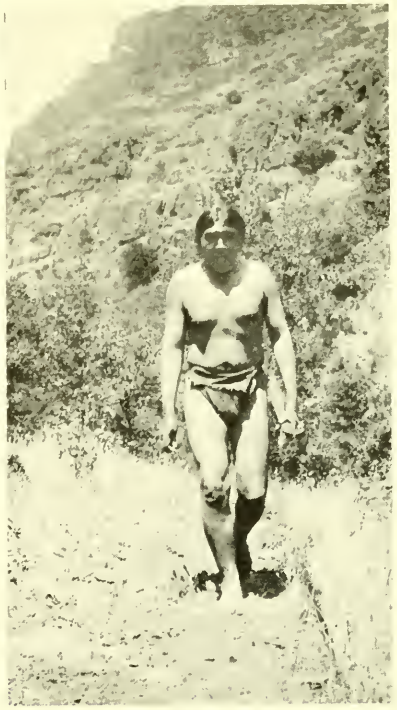


Fig. 2

Fig. 3

ISHI IN HIS OLD HAUNTS IN 1914

Fig. 1

Fig. 2

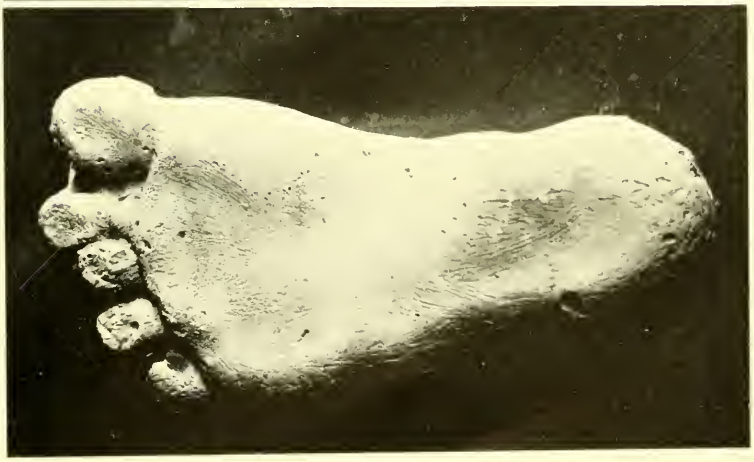
Fig. 3

ISHI 'S FEET FROM LIFE AND CASTS

Fig. 1

Fig. 2

Fig. 3



CASTS OF ISHI'S FEET

DEATH MASK, MARCH, 1916

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